We Claim:

1. A catalyst support comprising the result of the combination of:

(a) a support comprising hydroxyl groups;

(b) a capping agent comprising a boron containing Lewis acid; and

(c) an ionic activator, wherein at least some of the capping agent does not form a support bound activator.

2. The catalyst support of claim 1, wherein the support comprising hydroxyl groups comprises silica.

3. The catalyst support of claim 1, wherein the support comprising hydroxyl groups comprises silica calcined at about 400°C to about 700°C for a time less than or equal to about 12 hours.

4. The catalyst support of claim 1, wherein the support comprising hydroxyl groups comprises silica calcined in the presence of a fluorine source.

5. The catalyst support of claim 4, wherein the fluorine source comprises a fluoride salt.

6. The catalyst support of claim 1, wherein the support comprises less then or equal to about 0.1 millimole Si-OH functional groups per gram of support.

7. The catalyst support of claim 1, wherein the support comprises less then or equal to about 0.05 millimoles Si-OH functional groups per gram of support.

8. The catalyst support of claim 1, wherein the support comprises less then or equal to about 0.001 millimoles Si-OH functional groups per gram of support.

9. The catalyst support of claim 1, wherein the support comprises a plurality of particles, each particle having a plurality of pores arranged within the particle such that a surface of the pores defines an inner surface of the particle located internal to an outer surface of the particle, and wherein a concentration of Si-OH functional groups disposed on the inner surface of the particle is greater than a concentration of Si-OH functional groups disposed on the outer surface of the particle.

10. The catalyst support of claim 1, wherein the capping agent comprises R^1R^2BH, and wherein R^1 and R^2 are independently at each occurrence an organic radical comprising: C_1 -C_{40} -alkyl, C_1 -C_{40} -haloalkyl, C_6 -C_{40} -aryl, C_6 -C_{40} -haloaryl, C_7 -C_{40} –arylalkyl, C_7 -C_{40} -halo-arylalkyl, or a combination comprising at least one of the foregoing.

11. The catalyst support of claim 10, wherein R^1 and R^2 are independently at each occurrence an organic radical comprising pentafluorophenyl, nonafluoroanthracenyl, undecafluorotetrahydronaphthyl, nonafluorofluorenyl, 2,3,4,6-tetrafluorophenyl, 2,3,5,6-tetrafluorophenyl, 2,3,5-trifluorophenyl, 2,4,6-trifluorophenyl, 1,3-difluorophenyl, 2,3,5,6-tetrafluoro-4-methylphenyl, 2,3,4,6-tetrafluoro-5-methylphenyl, 2,4,5-trifluoro-6-methylphenyl, 2,3,6-trifluoro-4-methylphenyl, 2,4,6-trifluoro-3-methylphenyl, 2,6-difluoro-3-methylphenyl, 2,4-difluoro-5-methylphenyl, 3,5-difluoro-2-methylphenyl, 4-methoxy-2,3,5,6-tetrafluorophenyl, 3-methoxy-2,4,5,6-tetrafluorophenyl, 2-methoxy-3,5,6-trifluorophenyl, 3-methoxy-2,5,6-trifluorophenyl, 3-methoxy-2,4,6-trifluorophenyl, 2-methoxy-3,5-difluorophenyl, 3-methoxy-2,6-difluorophenyl, 3-methoxy-4,6-difluorophenyl, 2-methoxy-4,6-difluorophenyl, 4-methoxy-2,6-difluorophenyl, or a combination comprising at least one of the foregoing.

12. The catalyst support of claim 1, wherein the capping agent comprises bis(perfluorophenyl) borane.

13. The catalyst support of claim 1, wherein the ionic activator comprises boron.

14. The catalyst support of claim 12, wherein the ionic activator comprises an ammonium salt.

15. The catalyst support of claim 1, wherein the ionic activator comprises:
trimethylammonium tetraphenylborate,
triethylammonium tetraphenylborate,
tripropylammonium tetraphenylborate,
tri(n-butyl)ammonium tetraphenylborate,
tri(t-butyl)ammonium tetraphenylborate,
N,N-dimethylanilinium tetraphenylborate,
N,N-diethylanilinium tetraphenylborate,
N,N-dimethyl-(2,4,6-trimethylanilinium) tetraphenylborate,
trimethylammonium tetrakis(pentafluorophenyl)borate,
triethylammonium tetrakis(pentafluorophenyl)borate,
tripropylammonium tetrakis(pentafluorophenyl)borate,
tri(n-butyl)ammonium tetrakis(pentafluorophenyl)borate,
tri(sec-butyl)ammonium tetrakis(pentafluorophenyl) borate,
N,N-dimethylanilinium tetrakis(pentafluorophenyl) borate,
N,N-diethylanilinium tetrakis(pentafluorophenyl) borate,
N,N-dimethyl-(2,4,6-trimethylanilinium) tetrakis(pentafluorophenyl) borate,
trimethylammonium tetrakis-(2,3,4,6-tetrafluorophenylborate,
triethylammonium tetrakis-(2,3,4,6-tetrafluorophenyl) borate,
tripropylammonium tetrakis-(2,3,4,6-tetrafluorophenyl) borate,
tri(n-butyl)ammonium tetrakis-(2,3,4,6-tetrafluoro-phenyl) borate,
dimethyl(t-butyl)ammonium tetrakis-(2,3,4,6-tetrafluorophenyl) borate,
N,N-dimethylanilinium tetrakis-(2,3,4,6-tetrafluorophenyl) borate,
N,N-diethylanilinium tetrakis-(2,3,4,6-tetrafluoro-phenyl) borate,

N,N-dimethyl-(2,4,6-trimethylanilinium)tetrakis-(2,3,4,6-tetrafluorophenyl) borate,
di-(i-propyl)ammonium tetrakis(pentafluorophenyl) borate,
dicyclohexylammonium tetrakis(pentafluorophenyl) borate,
triphenylphosphonium tetrakis(pentafluorophenyl) borate,
tri(o-tolyl)phosphonium tetrakis(pentafluorophenyl) borate,
tri(2,6-dimethylphenyl)phosphonium tetrakis(pentafluorophenyl) borate, or a combination comprising at least one of the foregoing activators.

16. The catalyst support of claim 1, wherein the ionic activator comprises N,N-dimethylanilinium tetrakis(pentafluorophenyl)borate, triphenylcarbenium tetrakis(pentafluorophenyl)borate, or a combination comprising at least one of the foregoing.

17. The catalyst support of claim 1, wherein essentially all of the capping agent does not form a support bound activator.

18. A catalyst system comprising a catalyst support and a catalyst, the catalyst support comprising the result of the combination of:

(a) a support comprising hydroxyl groups;

(b) a capping agent comprising a boron containing Lewis acid; and

(c) an ionic activator, wherein at least some of the capping agent does not form a support bound activator.

19. The catalyst system of claim 18, wherein the catalyst comprises a metallocene.

20. The catalyst system of claim 18, wherein the catalyst comprises:
cyclopentadienyltitaniumtrimethyl,
cyclopentadienyltitaniumtriethyl,
cyclopentadienyltitaniumtriisopropyl,
cyclopentadienyltitaniumtriphenyl,

cyclopentadienyltitaniumtribenzyl,
cyclopentadienyltitanium-2,4-pentadienyl,
cyclopentadienyltitaniumdimethylmethoxide,
cyclopentadienyltitaniumdimethylchloride,
pentamethylcyclopentadienyltitaniumtrimethyl,
indenyltitaniumtrimethyl,
indenyltitaniumtriethyl,
indenyltitaniumtripropyl,
indenyltitaniumtriphenyl,
tetrahydroindenyltitaniumtribenzyl,
pentamethylcyclopentadienyltitaniumtriisopropyl,
pentamethylcyclopentadienyltitaniumtribenzyl,
pentamethylcyclopentadienyltitaniumdimethylmethoxide,
pentamethylcyclopentadienyltitaniumdimethylchloride,
η^5-2,4-dimethyl-1,3-pentadienyl)titaniumtrimethyl,
octahydrofluorenyltitaniumtrimethyl,
tetrahydroindenyltitaniumtrimethyl,
etrahydrofluorenyltitaniumtrimethyl,
(1,1-dimethyl-2,3,4,9,10-.eta.-1,4,5,6,7,8-hexahydronaphthalenyl)titaniumtr
imethyl,
(1,1,2,3-tetramethyl-2,3,4,9,10-,.eta.-1,4,5,6,7,8-hexahydronaphthalenyl)ti
taniumtrimethyl,
(tert-butylamido)(tetramethyl-η5 -cyclopentadienyl)dimethylsilanetitanium
dichloride,
(tert-butylamido)(tetramethyl-η5 -cyclopentadienyl)dimethylsilanetitanium
dimethyl,
(tert-butylamido)(tetramethyl-η5 -cyclopentadienyl) -1,2-ethanediyltitanium
dimethyl,
(tert-butylamido)(tetramethyl-η5 -indenyl)dimethylsilaLnetitanium dimethyl,
(tert-butylamido)(tetramethyl-η5 -cyclopentadienyl)dimethylsilane titanium (III)
2-(dimethylamino)benzyl;
(tert-butylamido)(tetramethyl-η5 -cyclopentadienyl)dimethylsilanetitanium (III)

allyl,
(tert-butylamido)(tetramethyl-η5 -cyclopentadienyl)dimethylsilanetitanium (II) 1,4-diphenyl-1,3-butadiene,
(tert-butylamido)(2-methylindenyl)dimethylsilanetitanium (II) 1,4-diphenyl-1,3-butadiene,
(tert-butylamido)(2-methylindenyl)dimethylsilanetitanium (IV) 1,3-butadiene,
(tert-butylamido)(2,3-dimethylindenyl)dimethylsilanetitanium (II) 1,4diphenyl-1,3-butadiene,
(tert-butylamido)(2,3-dimethylindenyl)dimethylsilanetitanium (IV) 1,3-butadiene,
(tert-butylamido)(2,3-dimethylindenyl)dimethylsilanetitanium (II) 1,3-pentadiene,
(tert-butylamido)(2-methylindenyl)dimethylsilanetitanium (II) 1,3-pentadiene,
(tert-butylamido)(2-methylindenyl)dimethylsilanetitanium (IV) dimethyl,
(tert-butylamido)(2-methyl-4-phenylindenyl)dimethylsilanetitanium (II)1,4-diphenyl- 1,3-butadiene,
(tert-butylamido)(tetramethyl-η5 -cyclopentadienyl)dimethylsilanetitanium (IV) 1,3-butadiene,
(tert-butylamido)(tetramethyl-η5 -cyclopentadienyl)dimethylsilanetitanium (II) 1,4-dibenzyl-1,3-butadiene,
(tert-butylamido)(tetramethyl-η5 -cyclopentadienyl)dimethylsilanetitanium (II) 2,4-hexadiene,
(tert-butylamido)(tetramethyl- η^5-cyclopentadienyl)dimethylsilanetitanium (II) 3-methyl-1,3-pentadiene,
(tert-butylamido)(2,4-dimethyl-1,3-pentadien-2-yl)dimethylsilanetitaniumdimethyl,
(tert-butylamido)(1,1 -dimethyl-2,3,4,9,10-.eta.- 1,4,5,6,7,8-hexahydronaphthalen-4-yl)dimethylsilanetitaniumdimethyl,
(tert-butylamido)(1,1,2,3-tetramethyl-2,3,4,9,10-.PI.-1,4,5,6,7,8-hexahydronaphthalen-4-yl)dimethylsilanetitaniumdimethyl,
biscyclopentadienylzirconiumdimethyl,
biscyclopentadienyltitaniumdiethyl,
cyclopentadienyltitaniumdiisopropyl,
biscyclopentadienyltitaniumdiphenyl,

biscyclopentadienylzirconium dibenzyl,
biscyclopentadienyltitanium-2,4-pentadienyl,
biscyclopentadienyltitaniummethylmethoxide,
biscyclopentadienyltitaniummethylchloride,
bispentamethylcyclopentadienyltitaniumdimethyl,
bisindenyltitaniumdimethyl,
indenylfluorenyltitaniumdiethyl,
bisindenyltitaniummethyl(2-(dimethylamino)benzyl),
bisindenyltitaniummethyltrimethylsilyl,
bistetrahydroindenyltitaniummethyltrimethylsilyl,
bispentamethylcyclopentadienyltitaniumdiisopropyl,
bispentamethylcyclopentadienyltitaniumdibenzyl,
bispentamethylcyclopentadienyltitaniummethylmethoxide,
bispentamethylcyclopentadienyltitaniummethylchloride,
(dimethylsilyl-bis-cyclopentadienyl)zirconiumdimethyl,
(dimethylsilyl-bis-pentamethylcyclopentadienyl)titanium-2,4-pentadienyl,
(dimethylsilyl-bis-t-butylcyclopentadienyl)zirconiumdichloride,
(methylene-bis-pentamethylcyclopentadienyl)titanium(III) 2-(dimethylamino)benzyl,
(dimethylsilyl-bis-indenyl)zirconiumdichloride,
(dimethylsilyl-bis-2-methylindenyl)zirconiumdimethyl,
(dimethylsilyl-bis-2-methyl-4-phenylindenyl)zirconiumdimethyl,
(dimethylsilyl-bis-2-methylindenyl)zirconium-1,4-diphenyl-1,3-butadiene,
(dimethylsilyl-bis-2-methyl-4-phenylindenyl)zirconium (II) 1,4-diphenyl-1,3-butadiene, dimethylsilyl-bis-tetrahydroindenyl)zirconium(II) 1,4-diphenyl-1,3-butadiene,
(dimethylsilyl-bis-fluorenyl)zirconiumdichloride,
(dimethylsilyl-bis-tetrahydrofluorenyl)zirconiumdi(trimethylsilyl),
(isopropylidene)(cyclopentadienyl)(fluorenyl)zirconiumdibenzyl,
(dimethylsilylpentamethylcyclopentadienylfluorenyl)zirconiumdimethyl,
or a combination thereof.

21. The catalyst system of claim 18, wherein the catalyst comprises: (tert-butylamido)(tetramethyl-η5 -cyclopentadienyl)-1,2-ethanediylzirconium dimethyl,

(tert-butylamido)(tetramethyl-η5 -cyclopentadienyl)-1,2-ethanediyltitanium dimethylbenzyl, (methylamido)(tetramethyl-η5 -cyclopentadienyl)-1,2-ethanediylzirconium dibenzhydryl,

(methylamido)(tetramethyl-η5 -cyclopentadienyl)-1,2-ethanediyltitanium dineopentyl, (ethylamido)(tetramethyl-η5-cyclopentadienyl)-methylenetitanium diphenyl,

(tert-butylamido)dibenzyl(tetramethyl-η5 -cyclopentadienyl)silanezirconium dibenzyl,

(benzylamido)dimethyl(tetramethyl-η5 -cyclopentadienyl)silanetitanium di(trimethylsilyl),

(phenylphosphido)dimethyl(tetramethyl-η5 -cyclopentadienyl)silanezirconium dibenzyl, or a combination thereof.

22. The catalyst system of claim 18, wherein the support comprises a plurality of particles, each particle having a plurality of pores arranged within the particle such that a surface of the pores defines an inner surface of the particle located internal to an outer surface of the particle, and wherein a concentration of the catalyst disposed on the inner surface of the particle is greater than a concentration of the catalyst disposed on the outer surface of the particle.

23. The catalyst system of claim 18, wherein the support comprising hydroxyl groups comprises silica.

24. The catalyst system of claim 18, wherein the support comprising hydroxyl groups comprises silica calcined at about 400°C to about 700°C for a time less than or equal to about 12 hours.

25. The catalyst system of claim 18, wherein the support comprising hydroxyl groups comprises silica calcined in the presence of a fluorine source.

26. The catalyst system of claim 18, wherein the fluorine source comprises a fluoride salt.

27 The catalyst system of claim 18, wherein the support comprises less then or equal to about 0.1 millimole Si-OH functional groups per gram of support.

28. The catalyst system of claim 18, wherein the support comprises less then or equal to about 0.05 millimoles Si-OH functional groups per gram of support.

29. The catalyst system of claim 18, wherein the support comprises less then or equal to about 0.001 millimoles Si-OH functional groups per gram of support.

30. The catalyst system of claim 18, wherein the support comprises a plurality of particles, each particle having a plurality of pores arranged within the particle such that a surface of the pores defines an inner surface of the particle located internal to an outer surface of the particle, and wherein a concentration of Si-OH functional groups disposed on the inner surface of the particle is greater than a concentration of Si-OH functional groups disposed on the outer surface of the particle.

31. The catalyst system of claim 18, wherein the capping agent comprises R^1R^2BH, and wherein R^1 and R^2 are independently at each occurrence an organic radical comprising: C_1 -C_{40} -alkyl, C_1 -C_{40} -haloalkyl, C_6 -C_{40} -aryl, C_6 -C_{40} -haloaryl, C_7 -C_{40} –arylalkyl, C_7 -C_{40} -halo-arylalkyl, or a combination comprising at least one of the foregoing.

32. The catalyst system of claim 31, wherein R^1 and R^2 are independently at each occurrence an organic radical comprising:

pentafluorophenyl, nonafluoroanthracenyl, undecafluorotetrahydronaphthyl, nonafluorofluorenyl, 2,3,4,6-tetrafluorophenyl, 2,3,5,6-tetrafluorophenyl, 2,3,5-trifluorophenyl, 2,4,6-trifluorophenyl, 1,3-difluorophenyl, 2,3,5,6-tetrafluoro-4-methylphenyl, 2,3,4,6-tetrafluoro-5-methylphenyl, 2,4,5-trifluoro-6-methylphenyl, 2,3,6-trifluoro-4-methylphenyl, 2,4,6-trifluoro-3-methylphenyl, 2,6-difluoro-3-methylphenyl, 2,4-difluoro-5-methylphenyl, 3,5-difluoro-2-methylphenyl, 4-methoxy-2,3,5,6-tetrafluorophenyl, 3-methoxy-2,4,5,6-tetrafluorophenyl, 2-methoxy-3,5,6-trifluorophenyl, 3-methoxy-2,5,6-trifluorophenyl, 3-methoxy-2,4,6-trifluorophenyl, 2-methoxy-3,5-difluorophenyl, 3-methoxy-2,6-difluorophenyl, 3-methoxy-4,6-difluorophenyl, 2-methoxy-4,6-difluorophenyl, 4-methoxy-2,6-difluorophenyl, or a combination comprising at least one of the foregoing.

33. The catalyst system of claim 18, wherein the capping agent comprises bis(perfluorophenyl) borane.

34. The catalyst system of claim 18, wherein the ionic activator comprises boron.

35. The catalyst system of claim 33, wherein the ionic activator comprises an ammonium salt.

36. The catalyst system of claim 18, wherein the ionic activator comprises:

trimethylammonium tetraphenylborate,
triethylammonium tetraphenylborate,
tripropylammonium tetraphenylborate,
tri(n-butyl)ammonium tetraphenylborate,
tri(t-butyl)ammonium tetraphenylborate,
N,N-dimethylanilinium tetraphenylborate,
N,N-diethylanilinium tetraphenylborate,
N,N-dimethyl-(2,4,6-trimethylanilinium) tetraphenylborate,

trimethylammonium tetrakis(pentafluorophenyl)borate,
triethylammonium tetrakis(pentafluorophenyl)borate,
tripropylammonium tetrakis(pentafluorophenyl)borate,
tri(n-butyl)ammonium tetrakis(pentafluorophenyl)borate,
tri(sec-butyl)ammonium tetrakis(pentafluorophenyl) borate,
N,N-dimethylanilinium tetrakis(pentafluorophenyl) borate,
N,N-diethylanilinium tetrakis(pentafluorophenyl) borate,
N,N-dimethyl-(2,4,6-trimethylanilinium) tetrakis(pentafluorophenyl) borate,
trimethylammonium tetrakis-(2,3,4,6-tetrafluorophenylborate,
triethylammonium tetrakis-(2,3,4,6-tetrafluorophenyl) borate,
tripropylammonium tetrakis-(2,3,4,6-tetrafluorophenyl) borate,
tri(n-butyl)ammonium tetrakis-(2,3,4,6-tetrafluoro-phenyl) borate,
dimethyl(t-butyl)ammonium tetrakis-(2,3,4,6-tetrafluorophenyl) borate,
N,N-dimethylanilinium tetrakis-(2,3,4,6-tetrafluorophenyl) borate,
N,N-diethylanilinium tetrakis-(2,3,4,6-tetrafluoro-phenyl) borate,
N,N-dimethyl-(2,4,6-trimethylanilinium)tetrakis-(2,3,4,6-tetrafluorophenyl) borate,
di-(i-propyl)ammonium tetrakis(pentafluorophenyl) borate,
dicyclohexylammonium tetrakis(pentafluorophenyl) borate,
triphenylphosphonium tetrakis(pentafluorophenyl) borate,
tri(o-tolyl)phosphonium tetrakis(pentafluorophenyl) borate,
tri(2,6-dimethylphenyl)phosphonium tetrakis(pentafluorophenyl) borate, or a combination comprising at least one of the foregoing activators.

37. The catalyst system of claim 18, wherein the ionic activator comprises N,N-dimethylanilinium tetrakis(pentafluorophenyl)borate, triphenylcarbenium tetrakis(pentafluorophenyl)borate, or a combination comprising at least one of the foregoing.

38. The catalyst system of claim 18, wherein essentially all of the capping agent does not form a support bound activator.

39. An addition polymerization process, wherein one or more addition polymerizable monomers are contacted with the catalyst system of claim 18 under addition polymerization conditions.

40. The addition polymerization process of claim 39, wherein the polymerizable monomer includes $C_2 - C_{100}$ olefins, $C_2 - C_{100}$ alpha olefins, or a combination comprising at least one of the foregoing.

41. The addition polymerization process of claim 39, carried out under slurry polymerization conditions.

42. The addition polymerization process of claim 39, carried out under gas phase polymerization conditions.

43. The addition polymerization process of claim 39, wherein condensed monomer or an inert diluent is present.

44. A process to make a catalyst support comprising:

contacting a support material comprising hydroxyl groups with a capping agent comprising a boron containing Lewis acid to produce a capped silica; and contacting the capped silica with an activator to produce the catalyst support, wherein the capping agent comprises boron, and wherein at least some of the capping agent does not form a support bound activator.

45. The process of claim 44, wherein the capping agent comprises R^1R^2BH, and wherein R^1 and R^2 are independently at each occurrence an organic radical comprising: C_1 -C_{40} -alkyl, C_1 -C_{40} -haloalkyl, C_6 -C_{40} -aryl, C_6 -C_{40} -haloaryl, C_7 -C_{40} –arylalkyl, C_7 -C_{40} -halo-arylalkyl, or a combination comprising at least one of the foregoing.

46. The process of claim 45, wherein R^1 and R^2 are independently at each occurrence an organic radical comprising pentafluorophenyl,

nonafluoroanthracenyl, undecafluorotetrahydronaphthyl, nonafluorofluorenyl, 2,3,4,6-tetrafluorophenyl, 2,3,5,6-tetrafluorophenyl, 2,3,5-trifluorophenyl, 2,4,6-trifluorophenyl, 1,3-difluorophenyl, 2,3,5,6-tetrafluoro-4-methylphenyl, 2,3,4,6-tetrafluoro-5-methylphenyl, 2,4,5-trifluoro-6-methylphenyl, 2,3,6-trifluoro-4-methylphenyl, 2,4,6-trifluoro-3-methylphenyl, 2,6-difluoro-3-methylphenyl, 2,4-difluoro-5-methylphenyl, 3,5-difluoro-2-methylphenyl, 4-methoxy-2,3,5,6-tetrafluorophenyl, 3-methoxy-2,4,5,6-tetrafluorophenyl, 2-methoxy-3,5,6-trifluorophenyl, 3-methoxy-2,5,6-trifluorophenyl, 3-methoxy-2,4,6-trifluorophenyl, 2-methoxy-3,5-difluorophenyl, 3-methoxy-2,6-difluorophenyl, 3-methoxy-4,6-difluorophenyl, 2-methoxy-4,6-difluorophenyl, 4-methoxy-2,6-difluorophenyl, or a combination comprising at least one of the foregoing.

47. The process of claim 44, wherein the capping agent comprises bis(perfluorophenyl) borane.

48. The process of claim 44, further comprising contacting the catalyst support with a catalyst precursor to produce a catalytic system.

49. The process of claim 48, wherein the catalyst precursor comprises a metallocene.

50. A catalyst support comprising the result of the combination of:

(a) a support comprising hydroxyl groups;

(b) a capping agent comprising a boron containing Lewis acid; and

(c) an ionic activator, wherein at least some of the capping agent does not form a support bound activator as determined by :

I) performing a time resolved luminescence analysis on a reference analyte comprising a catalyst precursor that is not in combination with the activator, to produce a plurality of reference output values, each being associated with a time resolved emission intensity at an emission energy;

II) performing a time resolved luminescence analysis on a sample analyte comprising the catalyst precursor in combination with the catalyst support, to produce a plurality of sample output values, each being associated with a time resolved emission intensity at an emission energy;

III) determining a reference emission energy and a reference lifetime each associated with a maximum emission intensity in the reference output values;

IV) determining a plurality of sample emission energy values and a plurality of sample lifetime values, each associated with a maximum emission intensity in the sample output values;

V) subtracting each of the sample emission energy values from the reference emission energy to produce a plurality of energy difference values;

VI) subtracting each of the sample lifetime values from the reference lifetime to produce a plurality of lifetime difference values;

VII) determining that an energy difference value, a lifetime difference value, or both representative of the combination of the support comprising hydroxyl groups and the capping agent comprising a boron containing Lewis acid are essentially zero values, and determining that an energy difference value, a lifetime difference value, or both representative of the combination of the support comprising hydroxyl groups and the ionic activator are essentially non-zero values, to determine that at least some of the capping agent does not form a support bound activator.

51. The catalyst support of claim 50, wherein the capping agent comprises R^1R^2BH, and wherein R^1 and R^2 are independently at each occurrence an organic radical comprising: C_1 -C_{40} -alkyl, C_1 -C_{40} -haloalkyl, C_6 -C_{40} -aryl, C_6 -C_{40} -haloaryl, C_7 -C_{40} –arylalkyl, C_7 -C_{40} -halo-arylalkyl, or a combination comprising at least one of the foregoing.

52. The catalyst support of claim 51, wherein R^1 and R^2 are independently at each occurrence an organic radical comprising pentafluorophenyl, nonafluoroanthracenyl, undecafluorotetrahydronaphthyl, nonafluorofluorenyl, 2,3,4,6-tetrafluorophenyl, 2,3,5,6-tetrafluorophenyl, 2,3,5-trifluorophenyl, 2,4,6-trifluorophenyl, 1,3-difluorophenyl, 2,3,5,6-tetrafluoro-4-methylphenyl, 2,3,4,6-tetrafluoro-5-methylphenyl, 2,4,5-trifluoro-6-methylphenyl, 2,3,6-trifluoro-4-methylphenyl, 2,4,6-trifluoro-3-methylphenyl, 2,6-difluoro-3-methylphenyl, 2,4-difluoro-5-methylphenyl, 3,5-difluoro-2-methylphenyl, 4-methoxy-2,3,5,6-tetrafluorophenyl, 3-methoxy-2,4,5,6-tetrafluorophenyl, 2-methoxy-3,5,6-trifluorophenyl, 3-methoxy-2,5,6-trifluorophenyl, 3-methoxy-2,4,6-trifluorophenyl, 2-methoxy-3,5-difluorophenyl, 3-methoxy-2,6-difluorophenyl, 3-methoxy-4,6-difluorophenyl, 2-methoxy-4,6-difluorophenyl, 4-methoxy-2,6-difluorophenyl, or a combination comprising at least one of the foregoing.

53. The catalyst support of claim 50, wherein the capping agent comprises bis(perfluorophenyl) borane.

54. The catalyst support of claim 50, wherein the ionic activator comprises boron.

55. The catalyst support of claim 54, wherein the ionic activator comprises an ammonium salt.

56. The catalyst support of claim 50, wherein the ionic activator comprises:
trimethylammonium tetraphenylborate,
triethylammonium tetraphenylborate,
tripropylammonium tetraphenylborate,
tri(n-butyl)ammonium tetraphenylborate,
tri(t-butyl)ammonium tetraphenylborate,
N,N-dimethylanilinium tetraphenylborate,

N,N-diethylanilinium tetraphenylborate,
N,N-dimethyl-(2,4,6-trimethylanilinium) tetraphenylborate,
trimethylammonium tetrakis(pentafluorophenyl)borate,
triethylammonium tetrakis(pentafluorophenyl)borate,
tripropylammonium tetrakis(pentafluorophenyl)borate,
tri(n-butyl)ammonium tetrakis(pentafluorophenyl)borate,
tri(sec-butyl)ammonium tetrakis(pentafluorophenyl) borate,
N,N-dimethylanilinium tetrakis(pentafluorophenyl) borate,
N,N-diethylanilinium tetrakis(pentafluorophenyl) borate,
N,N-dimethyl-(2,4,6-trimethylanilinium) tetrakis(pentafluorophenyl) borate,
trimethylammonium tetrakis-(2,3,4,6-tetrafluorophenylborate,
triethylammonium tetrakis-(2,3,4,6-tetrafluorophenyl) borate,
tripropylammonium tetrakis-(2,3,4,6-tetrafluorophenyl) borate,
tri(n-butyl)ammonium tetrakis-(2,3,4,6-tetrafluoro-phenyl) borate,
dimethyl(t-butyl)ammonium tetrakis-(2,3,4,6-tetrafluorophenyl) borate,
N,N-dimethylanilinium tetrakis-(2,3,4,6-tetrafluorophenyl) borate,
N,N-diethylanilinium tetrakis-(2,3,4,6-tetrafluoro-phenyl) borate,
N,N-dimethyl-(2,4,6-trimethylanilinium)tetrakis-(2,3,4,6-tetrafluorophenyl) borate;
di-(i-propyl)ammonium tetrakis(pentafluorophenyl) borate,
dicyclohexylammonium tetrakis(pentafluorophenyl) borate
triphenylphosphonium tetrakis(pentafluorophenyl) borate,
tri(o-tolyl)phosphonium tetrakis(pentafluorophenyl) borate,
tri(2,6-dimethylphenyl)phosphonium tetrakis(pentafluorophenyl) borate, or a combination comprising at least one of the foregoing activators.

57. The catalyst support of claim 50, wherein the ionic activator comprises N,N-dimethylanilinium tetrakis(pentafluorophenyl)borate, triphenylcarbenium tetrakis(pentafluorophenyl)borate, or a combination comprising at least one of the foregoing.

58. The catalyst support of claim 50, wherein essentially all of the capping agent does not form a support bound activator.